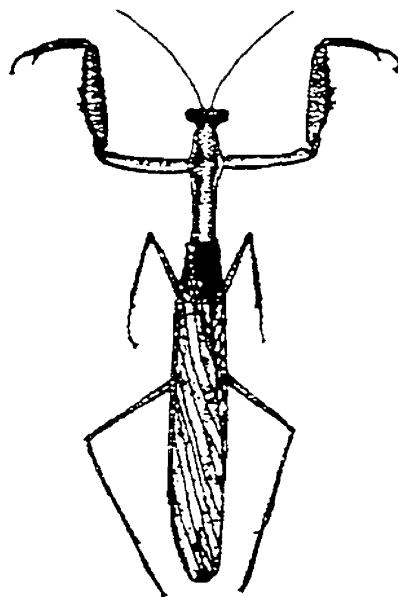


Mantis Study Group Newsletter 19

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Editorial

Happy new millennium! Once again thanks to Andy Lasebny for his contributions. Without Andy's efforts there would be little point in producing the newsletter! Will somebody else **please** write something for the newsletter.

Andy's comments on nature documentaries faking things by using US mantids in a European setting (page 4) does not surprise me. Some years ago I was asked to provide 2000 African cockroaches to company filming in a UK studio making a film about bats in a cave in Texas. They had the cockroaches eating a previously frozen bat, I believe the bat actually did come from Texas, two years previously. A word of warning if you provide animals to a film company, or you are filmed with your animals: if a company promises to send you a video of the footage, do not believe them. In my experience it never happens.

Andy's comments on *Stagmomantis carolina* being the most common US mantis agree with my observations on my only US trip in 1999. Hopefully I will put together a note on this trip for the next newsletter.

Exhibitions

We hope to be exhibiting at the following events.

Sunday 22nd April 2001

Midlands Entomological Fair. At Kettering Leisure Village. Open 1030-1630. The venue is just off junction 8 of the A14 and is usually well signposted.

Sunday 20th May 2001

British Tarantula Society Show. At Woodgreen High School, Wednesbury, West Midlands. Open 1100-1630. The venue is very close to junction 9 of the M6.

Mantis season 2000 in New Jersey — Andy Lasebny.

It has been the coolest July in 86 years, according to the news, in sharp contrast to the last few years of tropical-like heat and humidity. I wonder how this will affect the maturity time of the New Jersey mantids. During this month, I get a strange message on my answering machine. It sounds like a strange Monty Python sketch, but it is real. The BBC wants

European mantids for the filming of a documentary. Someone from Europe calling the U.S.A. to get European mantids. Sounds rather like circular logic. After contacting them by e-mail and by phone, it turns out they need about 30 individuals. Their timing is just right, since *Mantis religiosa* will be adults soon.

July 28th 2000 - I take my first serious walk around the buildings where I normally find mantids. It has been cool and wet lately, but since the earliest I ever found an adult *Mantis religiosa* has been July 29th, it's worth a look. Nothing that day. By August 1st the temperature, and especially the humidity, have gone up. There will be mantids soon!

August 3rd - The previous night was very warm, and extremely humid. There has to be something out there. I arrive at the shopping centre right off the highway outside the town I work in, and park the car, at around 0730. I get out and walk under the canopy of the strip mall, and immediately spot a green male *Mantis religiosa* on a window sill. I put him in a bag and keep walking. A short distance further down, another green male is on a window. I get him quickly. I continue walking, and see another green male of the same species on the beige stucco wall of another store. I get him too. Further down, right in front of the supermarket, I see what is left of a green female *Mantis religiosa* - a bird had eaten her, and there was only a pile of wings. A few minutes earlier, and I maybe could have saved her. I go back to the car after checking the rest of the shopping centre walls, and drive across one of the highways to another, large department store that has a huge glass wall in the front. There I find another green male, same species, on one of the panes of glass. I take him, and drive into the downtown area. I park the car and take a walk along the streets of the downtown area. Within five minutes, I find another green male on the window frame of a store. He is a bit smaller than the rest. Five so far, not bad.

August 4th - It rained late yesterday afternoon in some areas, and overnight in others. Probably not the best night for mantids. I check the same shopping areas as yesterday, and find nothing. Finally, in the downtown area, I find a large green female *Mantis religiosa* right on a gray concrete column that supports the canopy walkway of a row of stores. She is very calm and tame, and just walked right onto my hand. Late the same night, close to midnight, I find a smaller green female in the town I live in. She was on some daylily leaves in a garden that is in a public square. This is one of the few times I had actually found this species on vegetation instead of a building wall.

August 8th - At 0700 I arrive at the usual shopping centre. The previous night was warm, with no rain, after a very hot day. On the ceiling of the canopy of one of the stores is a small green female *Mantis religiosa*. I get her down with a long handled broom that I have in the car. I drive to the gas station to fill up the tank, and see a green male on the wall. I get him and drive to the downtown area. There I find a large green female on the wall under a large window, right near the ground. This is not very far from where I found the female on 4th August, on the opposite side of the buildings, along Main street. As I walk toward the office building in which I work, I see another large green female under the overhanging concrete cap that is on top of a low brick screen wall. Interesting contrast between last year and this year - last year there was a drought and it was very hot. Almost all of these mantids were brown. This year has been cool and wet - now they are all green. During lunch, I take another walk in the downtown area, and find a green male *Mantis religiosa* on a wall between two buildings, right across the street from the office building in which I work.

August 9th - On my drive to the shopping centre this morning, I see a green female right on the aluminum window frame of the very first store as I drive by. I park the car, and take

her. As I walk along the store fronts, I see a brown male on the ceiling of the canopy just a short distance down, and a green female, also on the ceiling. I go back to the car to get my long handled broom, but by the time I get back, the male has come down and is now on the wall, about three feet above the ground. Well, that makes it easier. Then I see the female ahead - she also came down to the wall. I take her too and drive to the downtown area. As I walk around the stores, I see a green male on the ceiling of the canopy. I get the broom, and coax him to walk onto it. Four on this humid, morning with on and off rain. But the previous night had been no rain and it was quite warm, so they are left over from then. During lunch, I go back to the shopping centre outside of town, this time to actually buy something, and find another green male on a pipe bollard right by the edge of the building that the first female was on this morning. On the way home, as I am accelerating onto the highway, I glance to the right and see a mantis on the wall of a nearby building. I drive into the parking lot, and it turns out to be a green male *Mantis religiosa*. That is six in one day.

August 10th - I arrive at the shopping centre at 0730 and see a green male on the ceiling, near where the others were yesterday. I get my broom and try to get him, but he starts to fly around. Finally he lands on the ground and I pick him up. Then I take a walk along the storefronts, and find a green female at the opposite end of the shopping centre, on a window sill about 30cm above the ground. Then I drive to the downtown area, and find a brown female on one of the concrete columns that support the canopy, not far from the one I found on August 4th. Total is now 21.

August 15th - After several days of rain and cooler than normal temperatures, I go for another walk to the usual places, not expecting to find anything, just like the day before. Finally, as I am walking toward the door of the building I work in, I see a green female *Mantis religiosa* right under a concrete projection on the wall, about 60cm above the ground. Every year I always find at least one or two right under that projection, anywhere along its length.

August 18th - The usual walk yields two green males on the walls of that same shopping centre, each one on completely opposite ends of the "L" shaped building. During my walk to the downtown area, I find a brown male up on one of the columns.

August 23th - After several cool nights and no mantis sightings, I find a green female *Tenodera aridifolia sinensis* on the window of a bank not too far from my town. I take her and release her into my garden, among the others of her kind which will be adults any day now. These are late this year, by more than a week, most likely due to the cooler than normal weather. I can see plenty of them if I take a walk through the town I live in on a sunny afternoon, but only one was an adult, a male, three days ago. At night, I find a green male *Mantis religiosa* on top of a shrub in my town, right near where I found that female in the beginning of the month.

August 24th - After a reasonably warm night, I arrive at the usual place, and find nothing, but on the window frame of another department store right next to the other shopping centre I find a green male *Mantis religiosa*. Then I find another one on the concrete projection on the wall of the office building in which I work. This is the third one this year in that same general area.

August 25th - A ride to the shopping centre this morning produces one male *Tenodera aridifolia sinensis*. He is high up on the window frame. It is interesting how the cooler than normal summer has affected the maturity time of this species much more than that of *Mantis religiosa*. These were reasonably on time, while the others are at least ten days late in

becoming adults. The first ones should have been around August 12th or so. A male *Mantis religiosa* is also nearby, but he is actually inside the store on the window, up high. He must have flown in when the door was open.

August 26th - At 2200 on this Saturday night I decide to take a ride to the place where I find the mantids. Maybe I will get to see where they actually come from. When I get there, I immediately see that male *Tenodera aridifolia sinensis* from yesterday. He is still in the same spot, and I take him down with a long stick. I go to the downtown area, and find a green male *Mantis religiosa* on one of those concrete columns. After walking around for a while, I see none arriving from anywhere. I still do not know where they arrive from and when. Only some small moths are flying around the parking lot and the lights. As I am ready to go home, I drive out onto the highway and then into a parking lot of a well-lit furniture store. There I find a green male *Mantis religiosa*.

August 28th - Today is the day of shipment. The number being shipped to the U.K. is 26 individuals, each in a food container with screen mesh covering a hole in the lid, and some twigs inside to hold onto. These are then put inside large styrofoam boxes that were originally used to ship fish to pet stores. Getting to this point was not easy. Neither I, the BBC, or the shipping company knew that this would not be an easy process. As I was spending the month gathering the mantids, there were a lot of telephone calls, e-mails, and paperwork to fill out. What none of us had known was that in order to legally ship out the mantids overseas I needed an export license from Fish and Wildlife. The package needed to be inspected before being shipped out in order to ensure that what is claimed to be in the package really is what is inside. Other delays included determining whether any New Jersey state laws were violated when I collected the mantids. No one in New Jersey seemed to know at first, and later it was determined that *Mantis religiosa* is not regulated. Then it had to be determined if it is legal to transport them across state lines to New York, where they would be shipped from! This caused more delays, since no one appeared to have any answers right away. It often took almost week to find out each step of this overly complicated process.

August 30th - On the wall of a store in the downtown area is a large brown male *Tenodera aridifolia sinensis*. I reach up and take him. There have not been as many mantids coming to the buildings overnight because of the abnormally cool nights. They just stay where they came from. Later in the evening, I stop at a supermarket not far from my house, and find another male like that on the aluminum window frame, but he is brown, green and orange.

August 31st - An early morning walk in the downtown area where I work produces 2 green male *Mantis religiosa*. They are right next to each other, one on the wall a few centimetres above the ground, and the other no more than a foot away but on the sidewalk. I pick both up and take them inside. I wonder why they both found their way so close to each other, when there are hundreds of linear feet of building they could be on.

An e-mail from the BBC lets me know that all 26 of the mantids have arrived safely on this day. Filming is to begin in early September. They will try to recreate a Mediterranean meadow in the studio and film the mantids' various activities. I guess nature documentaries are not always what they appear to be - a fake Mediterranean meadow in a studio with mantids from America! Makes you wonder about how all the other nature films that appear to be filming creatures in their natural habitat are really made. It is not as easy as it looks.

September 1st - On my way home not too far from where I live, I stop at a supermarket to buy some food, and on the way out I find a green female *Mantis religiosa* on the window sill in front of the store. Further down the highway, I stop at a parking lot that has a small

amount of leftover meadow type vegetation that was never mowed, and I stop to take a look. I immediately spot two male *Tenodera aridifolia sinensis*.

September 4th - There are many *T. sinensis* in the town in which I live, including the ones in my garden. A block away from my house, I can see several on a barberry hedgerow each day when I walk the dog. There are many here and there that are still nymphs, with one moult to go. I assume they are so late because of the cool weather. Yet, this cooler weather seemed to have little effect on *Mantis religiosa*'s time to adulthood.

Throughout September - Many more *T. sinensis* continue to be visible in my town, including mating pairs. Most are brown, only a few are green. Somehow, the rainy weather did not appear to affect the colour of these as much as that of *M. religiosa*. On the hedgerow in the town square are several large females that can be seen each day. By the middle of October, they have mysteriously disappeared, probably eaten by something, but not before leaving behind a total of seven egg cases on this row of hedges no larger than 8m long, by 0.6m high and about 45cm wide. Not bad. Next year there will be plenty here. The frosts have come early this year, in northern areas in late September, and other inland areas by mid October. In those places, many mantis populations may be affected, with not enough time to reproduce and lay eggs before the frost. Here, near the coast, there is plenty of time. The first hard frost did not arrive this year until November 21st, and at that point, mantis season is definitely over.

Brunneria borealis — Andy Lasebny.

September 8th 2000 - Received one *Brunneria borealis* female. This is a native American mantis, found in the South. This one was originally caught in Florida and sent to me. This is a very strange mantis. It is long and very thin, about the same length as the introduced Chinese mantis, 95mm long, but as thin as one of the native American stick insects. The forelegs are very thin as well, and the head is more or less triangular, but has eyes that bulge out to either side. The head is held in a different position - it appears to be always looking up, rather than in the normal 90° angle it is held at as with most mantids, and the antennae are thickened at the base, getting thinner at the ends. There are no wings, even in the adult. But the strangest thing about this mantis is that it is parthenogenetic - there are no males, only females, and the eggs hatch anyway, similar to some species of stick insects. As soon as I put this delicate looking creature into a large cage, I try giving it a medium sized cricket. The mantis immediately takes it from my hand. Though her forelegs are extremely thin and look delicate, she easily crushes the cricket.

September 19th - She makes her first egg case in captivity; it is possible that more had already been made in the wild, I do not know. It is small and sort of elongated, rather rectangular in shape, with a short, thick tapered hook-like projection at one end.

September 28th - Another small egg case is made.

October 6th - One more egg case. She eats quite well, but I have been hand feeding her so far, and she usually does not catch the crickets that I put in the rather large cage she is in otherwise. She is probably quite old, since she was found in Florida, and probably will not last much longer. I assume that a mantis from there will have hatched in early spring.

October 20th - She makes another egg case.

November 13th - After the last egg case, her 4th, and slowly deteriorating and barely able to eat, she finally dies of old age. The tarsi on some of her legs had fallen off, and she could

no longer climb properly. Even when hand feeding her, she had trouble catching and holding a cricket, often taking several slow strikes.

Now that she has made the four egg cases, from what I hear, this species takes 4-5 months to begin hatching and, supposedly, they do not come out all at once like most mantids do, but over a period of several months, a few hatchlings at a time. It will be interesting to see what happens next year.

The Carolina mantis — Andy Lasebny.

May 10th 2000 - An egg case of the Carolina mantis, *Stagmomantis carolina*, has hatched. This is a native American species that occurs in the south, and is supposedly the most common native species, but it is a species that is not found in New Jersey, which only has introduced species. I received the egg cases about a week ago from a person that is located in the Atlanta, Georgia area. About 100 individuals appear to be in the container. As I open the container to thin out the numbers and put some in another cage, I notice that they behave differently than newly hatched *Tenodera aridifolia sinensis*, which are out of control, running and jumping in random directions. These do not jump as much, and more easily walk onto twigs or where I direct them to.

May 13th - They are eating fruitflies now, but since all mine are the larger ones, only some of the more aggressive individuals are eating them. Since my order of the smaller *Drosophila melanogaster* will not arrive until next Wednesday, I go into the garden and find aphids on the roses, and these are readily eaten, since they are all different sizes. They drink water every time I spray the cage.

May 21st - Many have moulted for the first time in the past two days. There were a few instances of cannibalism as well.

May 29th - Many have moulted the second time, and there has been a lot of cannibalism, so it is time to separate at least some of them. There was actually one instance of a smaller individual grabbing a larger one, and attempting to eat it. Only with great difficulty was I able to separate them. The smaller one just would not let go.

June 7th - The third moults have been occurring over the past few days. They are about 25mm long now, and eat very well. Some are green, others a mottled brown. There is occasional cannibalism, and it is hard to control this with them all together. I now have most of them in a large cage with silk flowers stuck into florist's foam. This provides them with at least a somewhat natural living space and places to hide from each other and surfaces to moult from.

June 11th - They are growing very fast and are now capable of subduing surprisingly large crickets. Unfortunately, they also have a taste for each other. One will grab the other by the head and eat it. They almost always seem to do it that way when one cannibalizes the other. Often the entire mantis is consumed, and the aggressor gets quite plump afterwards. However, many are only partially eaten, from the head up to the mesothorax or metathorax, and the abdomens are often discarded. I suppose that for many of them, eating an entire other mantis is too much to eat at one time. All have moulted at least three times, some four times.

June 13th - The cannibalism is really out of control. Even though they are in the large cage with silk plants giving them plenty of hiding places, it is not good enough. More need to be

put into separate containers. Three were in a small food container for about two weeks, but in the last two days cannibalism reduced them down to one. I kept *Creobroter gemmatus* in this cage before this, and there was far less cannibalism. Most were able to stay there until they were adults. Another very interesting behaviour took place after I put some small crickets into the large cage. One grabbed the cricket, and began to eat it as another one looked on. After about 15 minutes, the cricket was about one third eaten, and the other mantis that was watching nearby grabbed the other end of the cricket and also began to eat it! The one that originally caught it seemed surprised at first and stopped for a minute, but then resumed eating it. For at least five minutes, both were eating the same cricket. Eventually, the late comer managed to steal the rest of the cricket from the other one and finished it. These mantids go after crickets that are larger than other species of the same size, and even if the cricket is too large and plump to get their forelegs around it. They just keep trying to strike at it, keep missing, but eventually find some part of the cricket to hold onto. *Tenodera aridifolia sinensis* nymphs of this size would either back away from such a cricket, or try only once, and if it was too big to grab, they would not try again, and the cricket would be in there for days, and the mantis would not eat until it was given something smaller. Not *Stagmomantis carolina*. They do not give up that easily.

June 14th - I separated most into their own containers, and left only seven or eight together still in the large cage.

June 19th - They are moulting and growing fast. A few are really getting big, and probably have no more than three moults left.

June 24th - The last of the ones kept together are now in separate containers. There are 21 individuals all together. This is about 20% of what originally hatched; very few died unexpectedly. Almost all of the losses were due to cannibalism. So far, there have been no moulting problems either. They do not seem to need high humidity, and hardly ever drink water any more.

July 5th - Many more have moulted, and there are only one or two moults left, it seems. One is the largest, and looks like there is only one moult left for that one, probably a female. There are many interesting colour variations and patterns; mostly mottled browns and greys, with touches of red-brown on some individuals. Some have green areas, or are pale tan on parts of the body. The head is shaped a little differently than that of the three New Jersey species - it is quite a bit wider in the horizontal dimension than in the vertical dimension, unlike the other species, whose heads are nearly equilateral triangles.

July 17th - The first adult emerges. It is a female, but not the one I thought was going to moult first. This species looks quite different from the New Jersey introduced species. The female's wings are short, only covering two thirds of the abdomen, with a small spot on the edge of the wing. The overall shape of the body is more slender as well, with a prothorax that is more angular with less rounded edges than the other species have. The length is about 6cm, about the same as an adult female *Mantis religiosa*, but more slender. There are also various patterns of stripes and mottled coloration on various parts of the body and wings.

July 18th - Another female becomes an adult, the one I thought was going to be first.

July 19th - A male becomes an adult, so does another female. The male is really slender and dark in colour. His wings extend the full length, past the abdomen.

July 20th - At 0630 two more females have just finished moulting, and are still hanging from their skins. A male becomes an adult later, but his wings did not come out right. They do not fold properly, and one forewing never stretched out completely. There appears to be a bit of greenish fluid on that spot, as if the body fluids needed to inflate the wings after the

first moult have leaked out.

July 21st - Three more females became adults.

July 22nd - One more adult female, and an adult male. The male whose wings did not come out right, dies suddenly. There must have been a lot more wrong than there appeared to be.

July 23rd - Another female becomes an adult.

July 24th - Three females become adults. This is all happening very fast. There are only a few left that are not yet adults. All the adult females are various shades of brown, tan, and gray. Not a single one turned out green. I guess they would have needed more humidity to be green. But they did quite well when kept dry. Two of the females have slight imperfections in one of the hindwings; on one side the hindwing does not fold correctly under the forewing, it sticks out off to the side. But otherwise, they appear healthy and are all eating very well, less than a day after the last moult. Many of the females pursue the crickets and do not wait for them to get closer.

July 27th - One more male and one female are adults early in the morning. This male also has cobalt blue wings. Almost all are adults, only two more to go.

July 29th - Another female becomes an adult. One more to go. It's almost time to have the earliest adults mate.

August 5th - I take out the first female to become an adult and the first male to become an adult, for mating purposes. I place the male on a houseplant, and put the female near him. Within a minute, he jumps on her back, momentarily facing the wrong way, then quickly turns around. The mating goes well, and they stay together for over six hours. When I try to put the male back into his cage, he flies around very quickly and erratically. He is quicker to fly than most males of other species, and darts back and forth in the air, and is hard to catch.

August 6th - Only one day after mating, that female, #1, lays her first egg case. The last one left that was not yet an adult becomes one today, a female. There are 15 females and five males.

August 9th - A male that became an adult on July 24th dies suddenly. Why so soon I do not know. At night, I get another pair to mate, female #2 that became an adult on July 18th, and a male that became an adult on July 22nd. Unfortunately, when I look for the male the next morning, I see that the female has eaten him. I should not have put them inside a cage. The first pair were free inside the room, so the male had a chance to escape. The female made an egg case the following day.

August 14th - Female #1 makes another egg case.

August 16th - Another pair mates, and the male survives. This time they were not in a cage, so he did escape. Since there are only three males left, and 12 females that have not yet mated, it will be almost impossible to get all of them to mate.

August 22nd - The last female to mate. #3, makes her first egg case.

August 23rd - The second female to mate makes her second egg case. It almost seems as if in this species the females try to hold off making egg cases unless they have mated, though that may just be a coincidence.

August 26th - One of the males dies unexpectedly. He did not even get a chance to mate. I better get some more of them to mate. I choose a female (#4) that became an adult on July 19th, and use the male that was the first to mate. They get together within five minutes. I leave the cage door open, so he can escape. He is fine the next day, far from her in the room.

August 28th - That female that just mated makes her first egg case.

August 29th - The first female to mate makes her third egg case.

August 30th - A female that became an adult on July 24th dies for no apparent reason. I give away the male that mated twice and two females, another one that became an adult on July 24th, and the last one to become an adult, on August 6th.

August 31st - Female #3 makes her second egg case.

September 1st - The last male left dies. Why these males died so quickly I do not know. They were adults for only a little over a month.

September 6th - Another egg case for that first female - her 4th. The ones that have not mated still have not made egg cases. Very strange.

September 12th - Female #4 makes her second egg case.

September 17th - Female #2 makes her 3rd egg case.

September 20th - Female #1 makes her 5th egg case.

September 30th - Female #4 makes her 3rd egg case.

October 2nd - Female #2 makes her 4th egg case, and female #3 makes her 3rd.

October 3rd - Female #1 makes her 6th egg case.

October 8th - Finally, a female that became an adult July 20th and did not mate makes her first egg case.

October 14th - Two more females that did not mate make their first egg case, one that became an adult July 20th, another from July 22nd.

October 15th - Female #2 makes her 5th egg case.

October 16th - Female #4 makes her 4th egg case.

October 18th - Female #1 makes her 7th egg case. Another two females that did not mate also make their first egg cases.

October 20th - Female #2 makes her 6th egg case.

November 1st - Female #1 makes her 8th egg case. And every one of the ones that did not mate all made one egg case during the past week, a few of them are up to two. All continue to eat very well, and show only slight signs of aging.

November 2nd - Female #4 makes her 5th egg case.

November 4th - Female #2 makes her 7th egg case.

November 6th - Female #3 makes her 4th egg case. A female that became an adult on July 29 is dead. She did make two egg cases although she was not mated.

November 10th - Female #4 makes her 6th egg case.

November 15th - Female #2 makes her 8th egg case.

November 16th - Female #3 makes her 5th egg case.

November 18th - Another egg case from female #1 - her 9th! Other females that did not mate are only on their second egg case.

November 19th - Female #2 dies, with little warning. Many of them are now starting to drink a small amount of water. They never did before, so I assume this is a sign of their old age and they will not last much longer.

November 24th - Another one dies, but not one of the mated ones. This one made only two egg cases.

December 2nd - Female #3 makes her 6th egg case.

December 5th - Female #1 makes her 10th egg case. These old mantids are now drinking more water, something they never bothered to do when they were younger. Though all have slowed down a bit and are not as quick as they were, they still do not have any trouble catching their prey.

December 11th - Female #4 makes her 7th egg case, a smaller one than all the others.

December 12th - Female #4 is dead, without warning.

December 16th - One more of them dies rather suddenly. They are all apparently reaching the end of their lifespans. Seven months appears to be the average.

December 19th - Another one is dead, though this one was showing signs of deterioration.

December 20th - One more egg case for female #1 - the 11th! This is the most egg cases I ever saw a mantis make. I doubt if the last three or four will be fertile.

December 21st - Female #3 makes her 7th egg case.

December 22nd - Another female dies, right in the same position she was in on the artificial plant in the container.

December 23rd - Female #1 dies suddenly. The 11th egg case turned out to be her last.

December 27th - Another one is dead of old age.

December 29th - One more dies. These die of old age by fading away for a few days, then they drop down to the cage floor. There are two unmated females left, and one mated one. One of the unmated ones just is not making egg cases. She remains plump and continues to eat, but does not make egg cases.

January 3rd 2001 - Three made it into the new year, but one dies today, the one who was not making egg cases.

January 7th - The last mated female is dead. She just slowly faded away, after she stopped eating for a while. She died exactly in the same spot in the cage where she was last, and did not fall to the cage floor. I actually had to check to see if she was really dead or not. The last one left is barely moving, and can no longer even eat.

January 11th - The last one is dead. This one lingered on for quite a while, refusing food and not making an egg case. The life cycle is complete, and the eggs are in the refrigerator for later hatching in the spring.

This species turned out to be a lot more interesting than I thought it would be, and is very easy to keep and maintain. They have minimal space requirements, and eat very well, better than average. Almost all individuals chased after their prey, especially the females. This is not a sit-and-wait predator to the extent many other species of mantids are. Most other species seem to only chase their prey when they are very hungry. These did it almost all the time, until they got too old to do so in the last week of their lives. The lifespan of the females are quite reasonable as well, a bit longer than the average Chinese mantis' lifespan. The biggest problem with these is cannibalism during the early stages of life. Otherwise, they are among the easiest to keep.

Mantis abstracts

The following are abstracts from papers published recently, or in some cases details of the paper but without an abstract. The papers are in English unless otherwise indicated. The editor would be grateful for copies of any recently published papers so that abstracts may be included in this section of the newsletters.

Ehrmann, R. (1999) Gottesanbeterinnen in Kopal und Bernstein (Insecta: Mantodea). *Arthropoda*, 7(3): 2-8, plates 1-3. [in German]

Preliminary results of a study of Mantodea in copal and amber; includes three colour photographs.

Ehrmann, R. (1999) *Stagmatoptera* Burmeister, 1838, eine interessante Gattung der Ordnung Mantoptera (Insecta: Mantoptera, Familie: Vatidae, Subfamilie: Stagmatopterinae, Tribus: Stagmatopterini). *Arthropoda*, 7(4): 10-15, plates 2-4. [in German]

Of the four examined species of the genus *Stagmatoptera* Burmeister, 1838 two species were synonymised as follows: *Stagmatoptera femoralis* var. *africana* Giglio-Tos, 1914 with *Stagmatoptera femoralis* Saussure & Zehntner, 1894 and *Stagmatoptera pavonina* Burmeister, 1838 with *Stagmatoptera (Mantis) hyaloptera* (Perty, 1832). The examined species are at the Berlin Museum (ZMBH) and Karlsruhe (SMNK). The paper includes three colour photographs.

Fontana, P. (1998) The Orthopteroidea-fauna of M. Summano (Venetian Prealps, Vicenza) (Insecta, Blattaria, Mantodea, Orthoptera, Dermaptera). *Bollettino del Museo Civico di Storia Naturale di Verona*, 22: 1-64.

The author presents the results of his investigations on the ecology and bioacoustics of the Orthopteroidea of M. Summano (Venetian Prealps, Vicenza). In total 54 species were found: 4 Blattaria, 1 Mantodea, 46 Orthoptera and 3 Dermaptera. Many species are particularly interesting because of their limited distribution in Italy: *Phyllodromica brevipennis*, *Isophya modestior*, *Poecilimon elegans*, *Pseudopodisma fieberi* and *Glyptobothrus mollis ignifer*. General and Italian distribution, corotype according Vigna Taglianti *et al.* (1992), altitudinal distribution and habitats on M. Summano of each species are outlined. The oscillograms of *Isophya modestior*, *Barbitistes obtusus*, *Platycleis g. grisea*, *Bicolorana bicolor*, *Chopardius p. pedestris*, *Pteronemobius concolor* and *Chorthippus p. parallelus* are shown.

Grabowitz, R. (1999) Die Tote Blatt Mantis *Deroplatys desiccata* Westwood, 1839. *Arthropoda*, 7(2): 14-16, plates 10 & 11. [in German]

Notes about rearing and keeping the dead leaf mantis *Deroplatys desiccata* Westwood, 1839 in culture groups. A description of the cage and a short review of the genus is included.

Harris, S.J. & Moran, M.D. (2000) Life history and population characteristics of the mantid *Stagmomantis carolina* (Mantodea: Mantidae). *Environmental Entomology*, 29(1): 64-68.

We investigated the life history and populations characteristics of the Carolina mantid, *Stagmomantis carolina* (Johannson), in central Arkansas. Unlike several studies on other mantid species found in the United States, this species was found at very low densities in the field as measured by adult abundance and ootheca density. We found that mortality was high during the egg stage because of developmental failure or egg parasitism. In replicated field plots, mortality and emigration was high during the 1st and 2nd stadia, resulting in very low numbers of in-plot survivors (<1%) by the 3rd stadium of development. Synchronous versus asynchronous hatching had statistically significant effects on emigration and in-plot mortality but a nonsignificant effect on in-plot survival, although the trend was for increased survival in asynchronous plots. Although arthropod abundance tended to be lower in mantid plots, *S. carolina* had no significant effects on total arthropod abundance, total arthropod biomass, or the abundance and biomass of any arthropod order. Laboratory experiments indicated that this species has slower development during the egg stage and slower development during the nymph stages compared with related mantid species. This slow growth may in part explain the high mortality rate and therefore explain the low density of *S. carolina* found in this population. However, this growth strategy seems necessary for survival because it allows for

proper timing of oviposition for a univoltine life cycle in central Arkansas. Comparative studies of this species in other portions of its range would be interesting in determining the generalities of our findings.

Morin, D. & Maldes, J. (2000) Catches of females of *Perlamanitis alliberti* Guérin-Meneville, 1843 (Dict., Mantodea, Amorphoscelidae). *Bulletin de la Société Linneenne de Bordeaux*, **28**(1): 51-52. [In French]

Abstract not available at present.

Triblehorn, J.D. & Yager, D.D. (2000) Wind-evoked neural responses in the praying mantis *Paraspheudale agrionina*. *Society for Neuroscience Abstracts*, **26**(1-2) Abstract No.-66.13.

Bats produce a significant amount of wind during flight and prey capture. Praying mantids possess a cercal-giant interneuron system capable of detecting this wind. Mantids perform flight escape maneuvers in response to bat ultrasonic echolocation calls, but mantis hearing is nondirectional. Wind generated by the approaching bat may provide directional cues and improve the mantid's chance to escape. In this experiment, neural responses to 250ms wind puffs ranging from 10-300cm/s presented from the rear or side of the cercus were measured extracellularly from either one (rear wind) or both (side wind) abdominal connectives. During the first 100ms of a rear stimulus, spike rates increase from 20 spikes/presentation (10cm/s wind) to 33 spikes at 100cm/s, leveling off at higher velocities. Three readily distinguishable units respond to wind: one unit responds to wind acceleration while the other units are both sensitive to wind velocity. Although the mean number of spikes for the full 250ms stimulus does not vary greatly across velocities, the firing pattern of these units do vary with wind speed. For side presentation, the connective ipsilateral to the stimulus has similar spike rates as rear stimulation, but the contralateral connective spike rates increase from 12 spikes/presentation (at 10cm/s) to 23 spikes/presentation at 100cm/s, also leveling off at greater velocities. In addition to this quantitative difference, activity between the connectives also varies qualitatively. This variation includes the number of units activated and their firing pattern. One or both of these differences could code directional information.

Yamawaki, Y. (2000) Effects of luminance, size, and angular velocity on the recognition of nonlocomotive prey models by the praying mantis. *Journal of Ethology*, **18**(2): 85-90.

Adult females of the mantis *Tenodera angustipennis* were presented with the "nonlocomotive" prey model, a static rectangle with two lines oscillating regularly at its sides, generated on a computer display. The models were varied in rectangle luminance (black, gray, and light gray), rectangle height (0.72, 3.6, and 18mm), rectangle width (0.72, 3.6, and 18mm), and angular velocity of oscillating lines ($65^\circ/\text{s}$, $260^\circ/\text{s}$, and $1040^\circ/\text{s}$) to examine their effects on prey recognition. Before striking the model, the mantis sometimes showed peering movements that involved swaying its body from side to side. The black model of medium size (both height and width) elicited higher rates of fixation, peering, and strike responses than the large, small, or gray model. The model of medium angular velocity elicited a higher strike rate than that of large or small angular velocity, but angular velocity had little effect on fixation and peering. We conclude that mantids respond to a rectangle in deciding whether to fixate, and to both rectangles and lines in deciding whether to strike after fixation.